Bandolier chooses items for its pages by a relatively simple process. On the one hand searching PubMed or the Cochrane Library, combined with some diligent journal reading, brings to light both systematic reviews and other important articles with methodological insights. On the other hand people ask about evidence on topics important to them, so we look for it. More often than one might think, these two separate approaches combine with what interests *Bandolier*, and the results appear in these pages.

General practitioners are most likely to come up with questions, usually following up an issue raised by a patient. Patients themselves are getting in touch, and a local branch of Age Concern has begun to ask important questions, and stimulate *Bandolier* to work harder on issues important to older people. Nurses, and especially community nurses, are beginning to find that evidence can be helpful to them also.

If there is a thematic change over nearly nine years, it is that the balance is tilting more than ever from wanting information about treatments, and towards wanting information about natural history, diagnosis, and prognosis.

Diagnosis is a problem, but from Scandinavia and North America there is an increasing flow of cracking studies looking at clinical scoring for diagnosis or prognosis, or risk. Two this month, on predicting early survival from stroke and recurrent fallers in the community. No high-tech gizmos, just simple observations. But the studies are fabulous examples of how to do it.

Some nice examples of observational studies, too. *Bandolier* continues to be impressed by the sorts of observations that can be made about natural history when you know what happened to *every* patient. From Norway a study on neonatal hip instability on over one million babies, plus the news that exercise does not cause knee arthritis. Methodological issues too, about before and after studies showing (again) how important handwashing can be.

In this issue

*The views expressed in **Bandolier** are those of the authors, and are not necessarily those of the NHSE*

POSTNATAL STEROIDS IN PRETERM INFANTS

Corticosteroids are prescribed in neonatal intensive care to reduce ventilator dependence and the rate of chronic lung disease in preterm infants. Given that neonatal intensive care is a highly specialised area, and given that there are already five good systematic reviews, including three super Cochrane reviews from Belfast [1-5], what interest could there be in examining a sixth?

The answer is that the sixth [6] addresses itself specifically to the question of long term neuro-development impairment, and suggests that short term benefits of corticosteroids may be more than outweighed by long term harm.

Review

The review used previous literature searches, supplemented by updating to September 2000, and supplemented by additional information provided by reviewers. For inclusion trials had to be randomised trials of glucocorticoids for the treatment or prevention of bronchopulmonary dysplasia. Children had to be premature infants of less than 32 weeks of gestation. The outcome sought was long term information on neuro-developmental impairment at one year or later, as well as mortality.

Results

There were eight included studies, all described in some detail, especially the definitions of impairment used in each study. One problem was that steroids may have been used in control infants. The proportion was unknown in three, known not to be present in two, and present to some degree in three.

Mortality was 28% in both groups (Figure 1, Table 1).

Among all randomised babies the risk of neurodevelopment impairment, and cerebral palsy (Figure 3), was higher in those given steroids than those not given steroids. For every 10 babies treated with steroids, one additional baby would develop cerebral palsy by one year.

Among all babies who survived the risk of neurodevelopment impairment, and cerebral palsy, was higher in those given steroids than those not given steroids. For every six babies treated with steroids, one additional baby would develop cerebral palsy by one year.

Bandolier's electronic resources at www.ebandolier.com

Comment

Several of the reviews comment that the result might not be too much of a surprise, as animal experiments have shown that steroid use in the early postnatal period is associated with impaired brain growth and development, and that it impairs head growth in premature infants. This is in contrast to antenatal steroid use which has been shown not to be harmful.

The Canadian review [6] is forthright in its conclusion: that any short term benefits are outweighed by long term harm, and that the use of postnatal steroids should be abandoned. The paper is available on-line at BioMed Central, with its prepublication history, and the reviewers agree. Authors of other reviews sound notes of caution.

So what to make of it? These reviews collectively make an interesting teaching set. But mostly they inform clinical governance and quality management issues. Not everyone will agree that postnatal steroids should not be used. The arguments may be cogent and pressing, but they need to be made and noted to protect babies, professionals and institutions.

References:
1   HL Halliday & RA Ehrenkranz. Early postnatal (<96 hours) postnatal corticosteroids for preventing chronic lung disease in preterm infants (Cochrane Review) In: The Cochrane Library, 1999, Issue 1, Oxford: Update Software.
2   HL Halliday & RA Ehrenkranz. Moderately early (7-14 days) postnatal corticosteroids for preventing chronic ling disease in preterm infants (Cochrane Review) In: The Cochrane Library, 2001, Issue 3, Oxford: Update Software.
3   HL Halliday & RA Ehrenkranz. Delayed (>3 weeks) postnatal corticosteroids for chronic lung disease in preterm infants (Cochrane Review) In: The Cochrane Library, 2001, Issue 3, Oxford: Update Software.
4   LW Doyle & PG Davis. Postnatal corticosteroids in preterm infants: systematic review of effects on mortality and motor function. J Paediatric Child Health 2000 36: 101-107.
5   T Bhuta & T Ohlsson. Systematic review and meta-analysis of early postnatal dexamethasone for prevention of chronic lung disease. Arch Dis Child Fetal Neonatal Ed 1998 79: F26-F33.
6   KJ Barrington. The adverse neuro-developmental effects of postnatal steroids in the preterm infant: a systematic review of RCTs. BMC Pediatrics 2001 1:1 (www.biomedcentral.com/1471-2431/1/1)
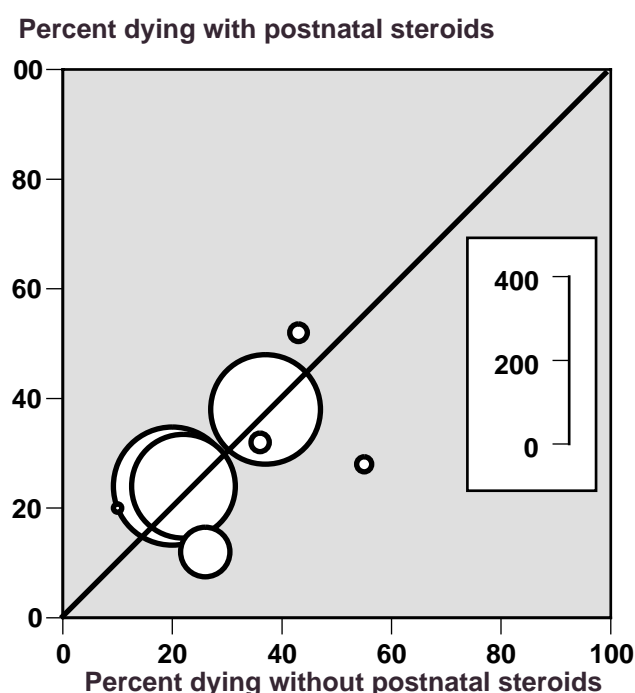
Figure 1: Mortality at one year

Percent dying with postnatal steroids
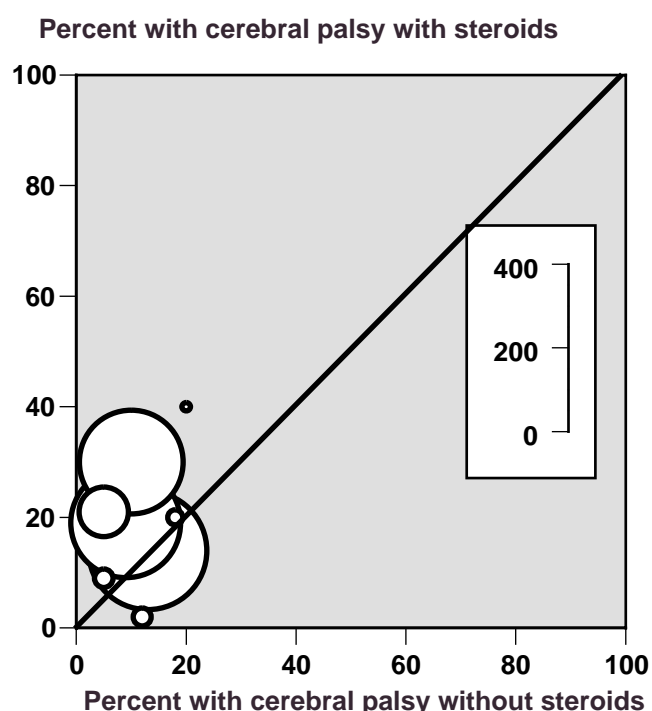Percent dying without postnatal steroids

Figure 2: Cerebral palsy at one year

Percent with cerebral palsy with steroids
Percent with cerebral palsy without steroids

Table 1: Results for mortality and neuro-developmental impairment at one year

Outcome	Babies with outcome (%)			
Among all babies randomised	Steroids N=539	Control N=513	Relative risk (95% CI)	NNT/H (95% CI)
Died	149 (28)	143 (28)	1.0 (0.8 to 1.2)	-432 (-18 to 19)
Impaired neurodevelopment	140 (26)	104 (20)	1.3 (1.01 to 1.6)	17 (9.3 to 161)
Cerebral palsy	107 (20)	52 (10)	1.9 (1.4 to 2.6)	10 (7.2 to 18)
Among all babies survived	Steroids N=339	Control N=340		
Impaired neurodevelopment	140 (41)	104 (31)	1.3 (1.1 to 1.6)	9.3 (5.6 to 28)
Cerebral palsy	107 (32)	52 (15)	2.0 (1.5 to 2.7)	6.2 (4.4 to 10)

NEONATAL HIP INSTABILITY AND INTRAUTERINE FACTORS

A mum-to-be has heard that vaginal delivery of a baby with a breech presentation leads to hip problems. Is that true or false? It is comforting to know that an enormous and comprehensive survey from Norway [1] gives us some real numbers to inform her what the risks are.

Study

Since 1967, every baby born in Norway has information recorded about maternal and neonatal health. That means that between 1970 and 1988 there was comprehensive information available on 1, 059, 479 newborns, with data on birth weight, sex, birth order, gestational age, mode of presentation, and delivery. The registry also has information about neonatal hip instability, together comprising congenital dislocation and sign of Ortolani (a good description of diagnostic tests can be found at www.aap.org/policy/ac0001.htm).

This comprehensive data set was examined for relationships between maternal and neonatal factors, and the chance of a baby having neonatal hip instability.

Results

There were 9,955 cases of neonatal hip instability in 1,046,000 live births, a prevalence at birth of 1%. After allowing for some stillbirths, multiple births and missing data, information was available for analysis on just under 960,000 babies.

Prevalence in female and male children at any gestational age was low, at less than 1% with vertex presentation. For breech presentation prevalence was higher, and especially related to gestational age and female sex with the first baby (Figure 1).

The prevalence of neonatal hip instability was lower at 0.26% in babies weighing less than 2,500 grams. For vertex or breech presentation, the prevalence was the same if delivery was vaginally or by Caesarean section.

Comment

So mum can be reassured that vaginal delivery will not increase the risk of neonatal hip instability if her baby has a breech presentation. The rest of us can be astounded by the huge amount of information on which this was based. There were 41,500 babies weighing less than 2,500 grams. There were 47,600 babies with vertex presentation delivered by Caesarean section. There were just under 24,000 breech presentations (2.5% of the total, a chance of 1 in 40) and 15,800 delivered vaginally and 8,000 by Caesarean section.

Vision multiplied by effort multiplied by quality and consistency makes for a potent brew. Recording what happens really should not be so difficult with a few little computers. It can really help drive professional and personal decision-making.

References:

1   T Hinderaker et al. The impact of intra-uterine factors on neonatal hip instability. An analysis of 1,059,479 children in Norway. Acta Orthop Scand 1994 65: 239-242.

Figure 1: Neonatal hip instability for first and subsequent births by gestational age in weeks with breech presentation

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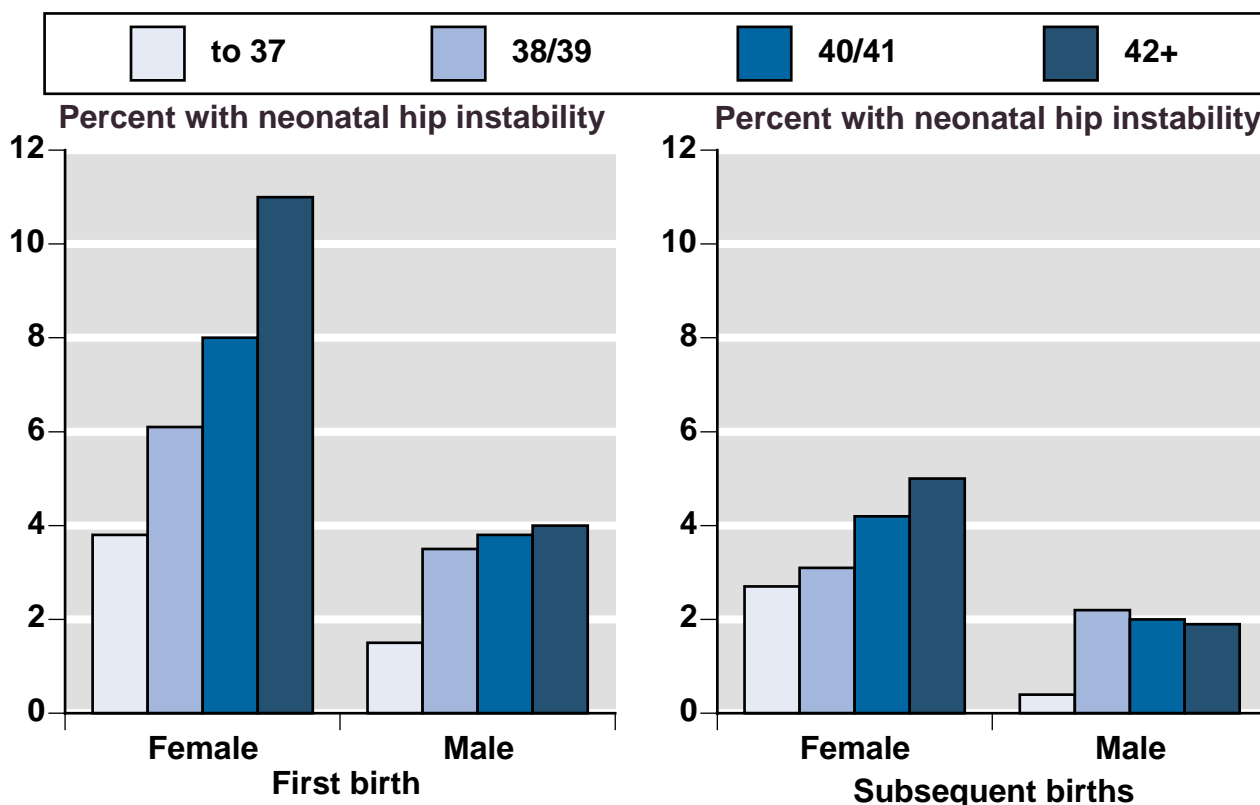
Handwashing and respiratory illness

Bandolier 67 and 82 examined the impact of handwashing on hospital acquired infection. Keeping hands washed reduces respiratory illness as well, and a report reinforces the importance of keeping up the pressure to make sure hands are washed [1].

Study

The study took place in the single US Navy training site for enlisted personnel at Great Lakes, Illinois. It was precipitated by withdrawal of an adenovirus vaccine and a review that showed that handwashing and general hygiene were challenges for recruits. The intervention was called Operation Stop Cough. It had six main elements:

- A directive that recruits washed their hands at least five times a day.
- A directive that sinks need not be kept dry to pass barrack inspection, but could be wet.
- Installation of liquid soap dispensers.
- Provision for soap dispensers to be filled.
- Monthly education of drill inspectors on importance of handwashing.
- Monthly inspection of barracks to include soap and sink availability.

Weekly rates of illness were compared for the year before and two years after introduction of the programme. A control group of advanced students on the same base but not in the programme was used.

Figure 1: Outpatient visits before the intervention (1996) and after (1997, 1998)
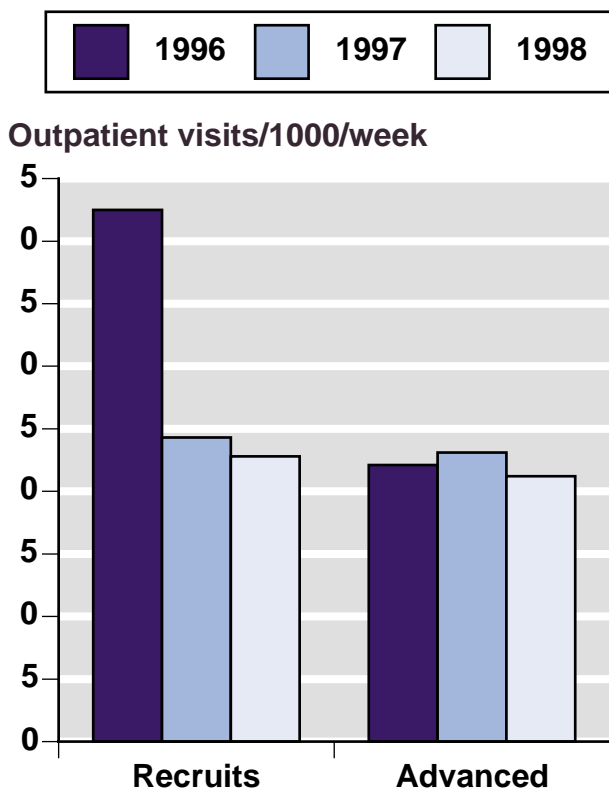
A stratified random sample of recruits was chosen at the end of basic training to answer a questionnaire on handwashing, respiratory symptoms, use of medical resources and time lost through illness.

Results

In each year there were about 45,000 recruits, with about 10,000 advanced students. There was no real difference between the periods other than a higher percentage of women and higher ambient temperatures in 1998 compared with earlier years.

The number of outpatient visits because of respiratory illness fell by about half for recruits in 1997 and 1998 after introducing the handwashing programme. Control advanced students saw no change in their lower rate of respiratory illness (Figure 1). Admission to hospital for respiratory illness was the same before and after the programme, and for recruits and advanced students at about 3.5 admissions per 1000 recruits per year.

More than 99% of 1445 recruits filled in the anonymous questionnaire. It showed that only about half washed their hands five times a day, with about 40% washing three to five times a day and 12% washing their hands fewer than three times a day. Frequent handwashers had less self-reported respiratory illness (3.2 episodes per recruit) than infrequent handwashers (4.7 episodes per recruit); the odds ratio was 1.5 (95% confidence interval 1.2 to 2.8). Infrequent handwashers had significantly more hospital admissions; the odds ratio was 11 (95% confidence interval 2.7 to 46).

Barriers to washing hands were insufficient time, insufficient sinks and insufficient soap.

Comment

This is a remarkably open examination of the difficulties of getting people to wash their hands, and some of the institutional tensions between medicine and operational issues shine through. They have an 1861 reference to show that things haven't changed much. There are lessons here about doing the simple things well. Forget the complex messages: just encourage people to wash their hands.

References:
1   MA Ryan et al. Handwashing and respiratory illness among young adults in military training. American Journal of Preventative Medicine 2001 21: 79-83.

EXERCISE DOES NOT CAUSE KNEE OSTEOARTHRITIS

Andrew's mother's hairdresser's friend has been known to say that the more exercise you have, the more you are likely to have knee problems when you are older. To put it bluntly, this old wife's tale is that *not* exercising is good for you. A new piece of quality research from Nottingham gives the lie to this [1].

Study

The dataset for the study was information from the Allied Dunbar National Fitness Survey. This was carried out in 1990-91 on roughly 200 people chosen at random from each of 30 parliamentary constituencies. This survey covered sport and exercise participation from age 14 to the date of interview. It also asked several key questions on knee injury.

Cases were selected retrospectively from people responding positively to questions about ever having arthritis, and still having it, suffering from continuous or recurrent pain in the knee, starting at over 40 years, and without pain, swelling or stiffness in wrists, hands or fingers. This corresponded closely with American College of Rheumatology criteria, and excluded inflammatory arthritis.

For each case, four age matched controls were selected.

Exposure to exercise was clearly demarcated by types of exercise more or less likely to strengthen knee joints, and specifically to regular long walks, in the periods 5-14 and 15-24 years before diagnosis, and at ages 14 to 19 and 20 to 24.

Results

There were 216 eligible cases, and 828 distinct individuals, with some controls being chosen more than once. Knee injuries before the diagnosis date were reported in 3% of cases and 0.3% of controls.

Table 1: Association between exercise, knee injury and knee OA in multivariate analysis

Variable	Odds ratio	p value
Walking 15-24 years before	1.5 (0.95 to 2.4)	0.08
Lot of exercise at age 20-24	1.6 (0.94 to 2.7)	0.09
Knee injury	6.7 (1.3 to 34)	0.02

Using logistic regression analysis to interrogate this complex data set led to only one statistically significant association, that between previous knee injury and development of knee osteoarthritis. A lot of exercise at ages 20-24, and regular long walks 5-14 and 15-24 years before were significant for univariate, but not multivariate analysis (Table 1).

Comment

This study has a brilliant discussion. It examines these results in relation to others, and sets them in place. It also is both self-critical and at the same time justifies the power of this analysis, and retrospective case series in general. There is much to be learned about methodology.

For simple souls, the message is that, by and large, exercise will not cause knee osteoarthritis in later life. The cautionary note is that not all exercises are equal, and if they cause knee injury, arthritis may well follow. *Bandolier* would prefer rowing or weight lifting to climbing, ice skating or skiing, where risks of other injuries are somewhat higher.

References:
1   AJ Sutton et al. A case-control study to investigate the relation between low and moderate levels of physical activity and osteoarthritis of the knee using data collected as part of the Allied Dunbar National Fitness Survey. Annals of Rheumatic Diseases 2001 60: 756-764.

THE PROBLEM OF MULTIPLE PUBLICATION

Anyone undertaking a systematic review will soon meet the problem of the same study being published more than once. Sometimes it is just that a study published, for example, in Welsh, is also published in a Serbo-Croat journal, though most often dual publication is English and another language. Sometimes it is a case of salami-slicing, where a little bit more information is given in a second publication, but 90% or more of the words are the same. Sometimes the duplication is obvious, but information on the same patients has been shown to be published more than once, and sometimes in papers with completely different authors [1].

Whatever the circumstances, it is really annoying, and never more so when the duplicate publications don't refer to one another. The poor reviewer has then to check things like demographic data to show that these two sets of patients are the same.

Systematic reviewers know that duplication is a big problem, but just how big is it? Previous estimates have suggested that about 15% or so of reports were duplicates, with up to 28% of patient data being duplicated [1]. There is a perception that much repetitive publication involves publication in several languages, but this is not always the case.

A survey of the surgical literature [2] suggests that one in every six original articles published in leading surgical journals is some form of multiple publication.

Study

Original articles published in 1998 in Surgery, British Journal of Surgery and Archives of Surgery formed the basis of the study. Names of first, second and last authors were combined with a few key words to search PubMed for possible duplication. When an abstract addressed the same topic as another abstract or paper, and shared methods or results and conclusions, it was suspected of duplication, and was retrieved in full for detailed examination.

A grading system for possible duplication was used:

♦ Dual publication was defined as papers having identical material, methods and conclusion.
♦ Potentially dual publication was defined as papers having almost identical material, methods and conclusion.
♦ Salami slicing was defined as studies representing part of, continuation of, or partial repetition of material found in the original article.

Results

The three journals provided 660 original articles, of which 92 (14%) led to 147 suspected duplicates, about 1 in 6 of the original articles. Of the suspected duplicates, 113 (77%) were not cited by the original article. About two-thirds of the suspected duplicates were published in surgical journals.

Twenty of the 147 suspected papers were defined as definite dual publication (14%), 50 as potential dual publication (34%) and 77 as salami-slicing (52%, Figure 1). Of the 660 original articles, 70 (11%) had actual or potential dual publications involving identical or almost identical studies.

Multiple publication was not confined to a second publication of a single article. Some papers had two or more suspected duplicates (Figure 2), and one had the distinction of having six suspected duplicates.

Comment

This is a great paper, and if it does nothing else it makes you think. It gives us 16 different adjectives for describing duplicate publication. It has a literature review of other attempts to get to grips with the problem of duplicate publication.
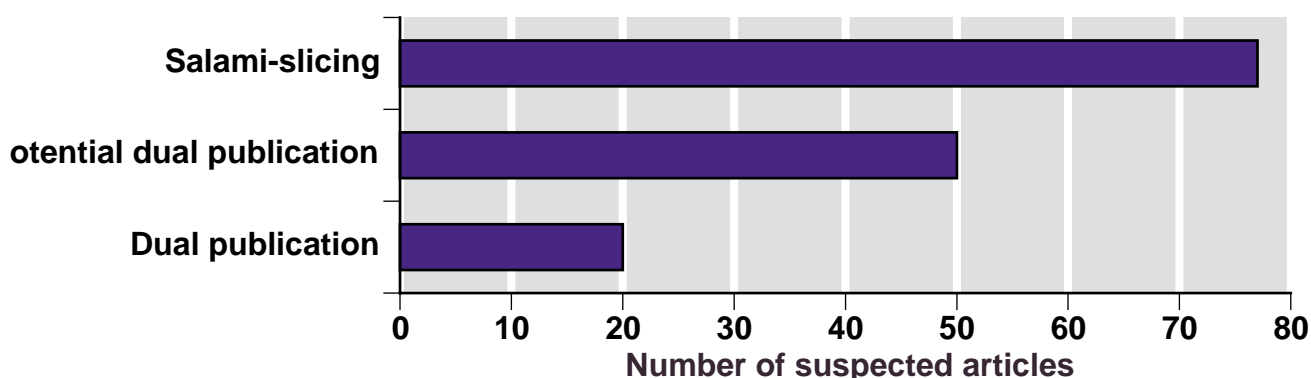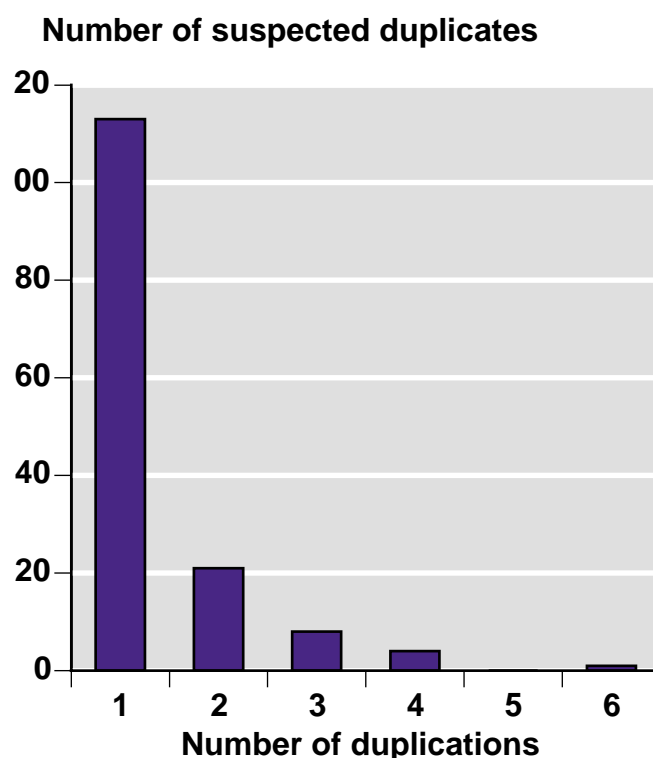
Figure 2: Multiple duplication of surgical papers

Number of suspected duplicates

The problem they are describing is not one of English/another language duplication, as this was relatively rare in their findings. Most studies came from academic departments, and 95% of the original publications were from university centres. Perhaps the problem lies in the need to generate lengthy lists of publications to get on in this rarefied environment. Perhaps the answer lies in having to put forward only one's five *best* papers.

In any event, it is a timely reminder that we need to be vigilant when pulling evidence together. It is also a study easy to reproduce in other specialties. Stopping it may be harder, even if journals or reviewers did their own searches.

References:
1   M Tramèr et al. Effect of covert duplicate publication on meta-analysis; a case study. BMJ 1997 315: 635-40.
2   M Schein & R Paladugu. Redundant surgical publications: tip of the iceberg? Surgery 2001 129: 655-661.

Figure 1: Type of repetitive publication of surgical papers

PREDICTING EARLY STROKE SURVIVAL

Early prediction of recovery with good quality of life after stroke can be done using a scoring system that combines magnetic resonance imaging, stroke scores and time from admission [1], and has been summarised on the *Bandolier* Internet site. What about the corollary, that of predicting likelihood of death in the first month, and when magnetic resonance imaging is not available? A study gives a way of doing just that using a simple clinical scoring system.

Study

The study involved a retrospective cohort of consecutive 440 patients admitted with a diagnosis of acute ischaemic stroke. Exclusions were intracerebral or subarachnoid haemorrhage, patients with unclear diagnosis, or where the diagnosis was recorded as acute cerebrovascular accident.

Patients were randomly allocated to a derivation and a validation group. The derivation group was used to develop the prediction model, and the validation sample was used to test the prediction model. The primary outcome was death within 30 days of admission, ascertained using linkage of patient records to mortality data. A number of baseline measures were investigated for the model. Included were level of consciousness (including impaired consciousness, defined as drowsy but responsive to verbal stimuli), dysphagia with moderate or severe swallowing difficulty.

Results

The 440 patients came from a larger sample of 544 before exclusions. Of the 440, 45 (10%) died within 30 days. The mean age was 70 years. About a quarter had impaired consciousness or were unconscious, 20% had dysphagia, and 10% had faecal or urinary incontinence.

Death rates were higher with impaired consciousness (Figure 1) and in those with dysphagia (40%), had urinary incontinence (61%) had a body temperature above 36.5°C (15%) and had hyperglycaemia without a history of diabetes (11%). These were all factors that remained significant in a regression model (combining unconscious and impaired consciousness), and they were given "points" according to the hazard ratios from the statistics – greater levels of significance were given more points.

The final model is given in Table 1. Mortality clearly increased with prognostic index (Figure 2). The risk of 30-day mortality with patients with scores of less than 11 was 3%, and for those with scores of 11 or more was 75%. The

Table 1: Scoring prognostic factors

Prognostic index for 30-day stroke mortality	
Factor	**Points**
Impaired consciousness	5
Urinary incontinence	4
Dysphagia	3
Admission temp >36°5C	2
Hyperglycaemia with no history of diabetes	2
Maximum	**16**

Figure 2: Mortality and prognostic score
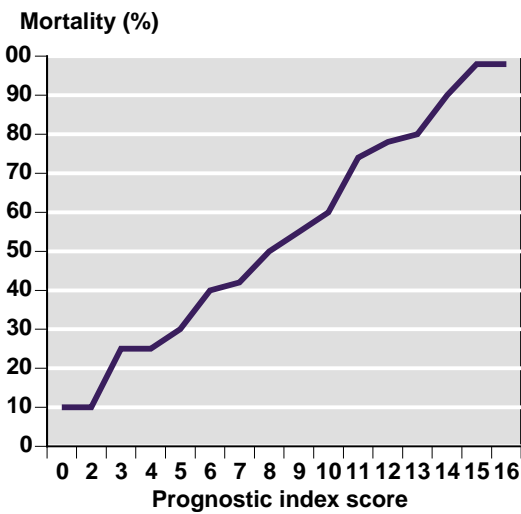
likelihood ratio for a score of 11 or more was 34, and for one of less than 11 was 0.3. The validation group gave almost identical results to the derivation group.

Comment

This is a good exemplar of how to construct a useful clinical scoring system. It tells us something we want to know, and allows us to perform a simple calculation from readily available clinical data, without resort to high technology. Ideally we would like to see a prospective evaluation, and the authors tell us they are doing this.

References:
1   EA Baird et al. A three-item scale for the early prediction of stroke recovery. Lancet 2001 357: 2095-2099.
2   Y Wang et al. A prognostic index for 30-day mortality after stroke. Journal of Clinical Epidemiology 2001 54: 766-773.

Figure 1: Level of consciousness and mortality after stroke

PREDICTING FALLS IN OLDER PEOPLE IN THE COMMUNITY

Bandolier 85 examined predictors for falling in hospital. What many people asked for was a set of predictors for falling in the community. A study from Holland [1] goes a long way to providing that, as well as explaining how studies of diagnostic or prognostic algorithms can be done.

Study

In Amsterdam, a ten-year study of ageing in older people (55-85 years) collected information on a random sample of people in this age range, representing the older Dutch population. A sub-sample of 1420 those aged 65 or more was chosen, of whom 1374 were willing and able to participate in a study of falling over one year.

A very wide range of sociodemographic variables were collected at baseline, as well as self-reported information, and medication information taken from containers used, and included prescribed and non-prescribed medicines. Assessment of physical functioning included questions on problems with feet and muscles, dizziness, and visual impairment. Functional limitations were considered to be present when participants had difficulty with at least two activities – climbing stairs, using their own or public transport, or cutting toenails. Poor vision was determined by ability to recognise a face at a distance of four metres, with glasses or contact lenses if used.

Falls over one year were determined by use of a falls calendar, completed weekly and mailed every three months, with telephone reminders.

Results

Participants had a mean age of 75 years. All four three month periods were completed by 94% of participants. At least one fall occurred in 33%. A single fall occurred in 22% and recurrent falls in 11%. Fractures were more common in recurrent fallers than in single fallers or those who did not fall (Figure 1). Recurrent falls were more common in older men, but not older women.

A number of variables were associated with falls in univariate analysis, but only a small number for multivariate analysis. Regression coefficients from logistic regression were converted to scores (Table) for these factors.

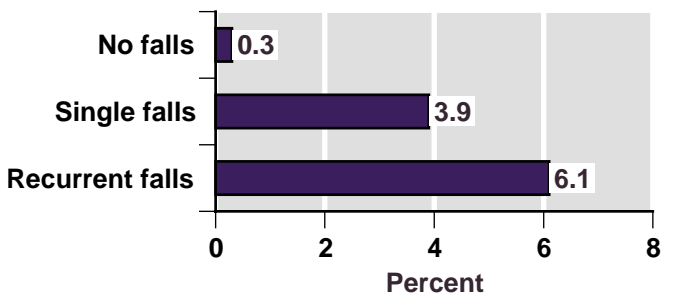### Figure 1: Fracture rates with no falls, single falls and recurrent falls

Table 1: Predictive factors and scores for single and recurrent falls

Factor	Single falls Points	Recurrent falls Points
Previous falls	5	5
Urinary incontinence	2	3
Visual impairment	2	4
Benzodiazepine use	2	3
Maximum	**1 1**	**1 5**

Figure 2: Predicted levels of recurrent falls with increasing scores
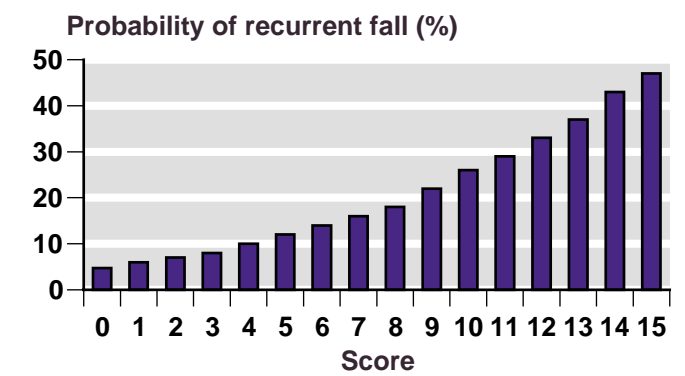
The predicted percentage of recurrent fallers for each score is shown in Figure 2. At a score of 7 points, where 15% of recurrent fallers would be expected, the positive likelihood ratio was 2.6 and the negative likelihood ratio was 0.58.

Comment

There's good methodology here. In Mr Punch's words, "that's the way to do it". There is a table of sensitivities and specificities so that the impact of various risk scores can be examined, either in terms of likelihood ratios or absolute risk.

How useful is it? Firstly it is simple, with four easily-remembered keys to risk of recurrent falls. If an older person has some or all of these, then it may be worth a hard look at things that might help. For instance, an older person with previous falls, visual impairment and on benzodiazepines has a score of 12 and a one-year risk of recurrent falls of 1 in 3. That's 1 in 1 over three years. So thinking about alternatives to, or no benzodiazepines, or suggesting changes in the home or institutional environment, or alert systems in case of a fall might all make sense.

Assessing older people in the community for their risk of falling could be a useful feature of clinical governance or quality improvement. It is a big problem (*Bandolier* 20).

References:
1   AM Tromp et al. Fall-risk screening test: a prospective study on predictors for falls in community-dwelling elders. J Clinical Epidemiology 2001 54: 837-844.